

## EDITORIALS.

IN THE PREFACE to the second edition of his *Survival of the unlike*, Professor L. H. Bailey explains his adoption of the idea of the phyton as a unit of plant structure and function, to which in a review of the first edition<sup>1</sup> we took exception, asking whether the idea of the shoot would not answer the purpose better, since the variations to which he called attention existed not so much in the successive phytons as in the shoot taken as a whole. We quote his words of reply in order to examine further his conception of the phyton:

It is by no means essential to the conception of the phyton that the different phytons upon any branch shall be unlike; although it should be remembered that, as a matter of fact, no two branches on a plant are alike, and yet every branch springs from a phyton. The point is that any phyton is capable of making a new plant, and the characters of that new plant will be very markedly determined by the conditions under which it grows. The phyton is simply the unit of asexual propagation as the seed is of sexual propagation. (See the contrasts of the *Keime* and the *Knospen* in Möbius' recent *Beiträge zur Lehre von der Fortpflanzung der Gewächse*.)

The word bud might be substituted for phyton, but that word now has two or three technical uses; and, moreover, it is not always necessary that actual buds be present in order that phytons shall grow when made into cuttings or grafts. Potentially, every node and internode of the plant is an individual, for it possesses the power, when removed and properly cared for, of expanding into what we call a plant, and of perfecting flowers and seeds and of multiplying its kind (p. 83).

THE HISTORY of the theory of the phyton is that of every other discarded theory. Its form is first modified; then it is remodeled again and again in the hope of making it fit the facts better, until finally it is apparent that it must be entirely abandoned for something better. Gaudichaud brought the phyton into prominence, basing the theory upon the anatomical vagaries of Wolff and Du Petit Thouars. But a fuller knowledge of anatomy through the researches of von Mohl led to the general abandonment of the concept in the form in which he advocated it. Dr. Gray adopted the idea in a modified form, retaining the term phyton, and was the first to introduce it authorita-

<sup>1</sup> BOT. GAZ. 22: 501. D. 1896.  
1897]



tively into American botanical literature through his *Botanical Text-book*. In his *Structural Botany*, as late as 1879, he affirms that "this theoretical conception of the organic composition of the plant is practically important to the correct understanding of morphological botany." From this source probably most of us of this generation derived the idea and believed it to be of value.

It should be observed that the phyton or phytomer of Gray was a single node and internode with its leaf or leaves. No account whatever was taken of the root, which was looked upon as, normally, a mere appendage of the lowest phyton, the like of which other phytons were capable of producing. It is scarcely necessary to say that no one who now considers the origin of the primary root can look upon it as morphologically an outgrowth of the shoot, and Gray's phyton has been abandoned just as Gaudichaud's was.

PROFESSOR BAILEY has felt it necessary to remodel the definition yet again. To him it is "that asexual portion of any plant which is capable of reproducing itself."<sup>2</sup> Now no one is more familiar than Professor Bailey with the multifarious ways in which plants are propagated by the gardener, and we must understand from these words that a leaf-fragment of begonia or a root-cutting of an aspen constitute a phyton. Surely in no possible sense can these be considered as morphologically equivalent parts. Thus, beginning as an anatomical concept, the phyton has lost even an appearance of morphological significance. Let us then examine it as a physiological concept in the light of Professor Bailey's explanations.

In the preface already quoted, he says: "the phyton is simply the unit of asexual propagation as the seed is of sexual propagation." This mystifies us, though we have not failed to consider Möbius' contrast between *Keime* and *Knospen*, as admonished (*Post*, p. 385). The only viable structure that one finds in the seed is the embryo, usually with a well developed shoot consisting of a stem with a leaf or leaves, and a root. Yet we must understand that this embryo is not a phyton in Professor Bailey's sense, though it "reproduces" itself precisely as a cutting would!

And, finally, we are told that, were it not for its various meanings, "the word bud might be substituted for phyton." (Now as a bud is merely an undeveloped shoot, it would seem that this is not far from

<sup>2</sup>Survival of the unlike 84.



the suggestion originally made in the review.) Such groping after the shadowy phyton is not only hopeless but useless. If, potentially, every node and internode of a plant is an individual, for the reason which Professor Bailey assigns, so is every fragment which contains a growing point or is capable of forming one when injured. How large the "individual" will be depends solely upon the necessities of nutrition. What a curious sort of *indivisibility* this is!

The attempt to find a unit of individuality in the phyton has utterly failed, and the whole fancy may well be abandoned. We shall then be rid of at least one technical term which is no longer needed to express an idea. Professor Bailey's well grounded point as to the overmastering influence of external conditions upon the form of members can be quite as adequately expressed in terms of modern anatomy.